



Massachusetts Department of Environmental Protection Source Water Assessment and Protection (SWAP) Report for Waubeeke Springs

What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- ? Inventory land uses within the recharge areas of all public water supply sources;
- ? Assess the susceptibility of drinking water sources to contamination from these land uses; and
- ? Publicize the results to provide support for improved protection.

SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the
Massachusetts Department of
Environmental Protection,
Bureau of Resource Protection,
Drinking Water Program

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Table 1: Public Water System (PWS) Information

PWS Name	Waubeeke Springs
PWS Address	47 New Ashford Road
City/Town	Williamstown, Massachusetts
PWS ID Number	1341004
Local Contact	Mr. William Enser
Phone Number	413-243-1416

Zone II GIS ID #	603	System Susceptibility	Low
Spring Name		Zone I, ft (squares)	Susceptibility
Spring #1	1341004-01G	800	Low
Spring #2	1341004-02G	800	Low

Introduction

We are all concerned about the quality of the water we drink. Ground water sources may be threatened by many potential contaminant sources, including septic systems, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential contaminant sources, the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

This report includes:

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

1. Description of the Water System

Waubeeke Springs is a small community system that serves approximately 20 homes in Williamstown. Williamstown is a small community in the northwest corner of Massachusetts with a diverse economic base of education, agriculture, retail, industry and residential activity. Waubeeke Springs maintains two (2) spring sources of water. The

What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

bedrock spring sources (01G and 02G) are located in relatively close proximity to each other in the central section of town.

During the early 1990s, the system was completely reconstructed to protect the sources from surface water runoff and influence. The springs are primarily bedrock springs discharging water from fractured dolomite. However, the immediate vicinity of the springs has some minor unconsolidated sand and gravel materials (stratified drift) of undetermined thickness that may contribute some recharge to the spring system. The collection boxes were reconstructed and the area graded to protect the springs from surface influences. The bedrock in the area is mapped as the Stockbridge Formation, a dolomite/marble. There is significant bedrock exposure in the area with some areas of thin to moderate depth of till overlying bedrock. There is no evidence of a significant and continuous protective, confining unit throughout the protection areas. Sources located in aquifers such as this are considered to be highly vulnerable to contamination from activities conducted on the land surface in the recharge areas.

The Zone I is the most protected area around a groundwater source. The Zone I for a spring is a square area centered on the source in the direction of flow with the source 50 feet from the downgradient edge of the Zone I. The lengths of the sides of the square are based on the estimated flow from the spring or estimated volume of water used from the source. The maximum estimated flow from the springs was over 240 gpm and therefore the length of the sides of the square Zone I area is 800 feet. The volume of the discharge ranged from 49 gpm to well over 240 gpm. The USGS was contracted by the DEP to determine the contribution areas (Zone II) to spring sources as part of the SWAP program. Please refer to the enclosed map for the outline of the protection areas for the sources. The entire Zone I and Zone II areas are entirely forest. You may request additional, current information regarding the quality of the water, from the local contact listed in Table 1. Please refer to the attached maps of the Zone I and Zone II protection areas and Table 2 for additional assessment information.

What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

2. Discussion of Land Uses in the Protection Areas

There are few land uses and activities within the drinking water supply protection areas that are potential sources of contamination. The sources have had a low risk ranking for the initial round of Microscopic Particulate Analysis to determine if they area under the influence from surface water.

Table 2: Table of Activities within the Water Supply Protection Areas

Potential Contaminant Sources	Zone I	Zone II	Threat	Comments
Wildlife/microbial	Yes	Yes	Low	The potential threat to this source, at this time, is from natural sources and not anthropogenic land use at this time.

-For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - www.state.ma.us/dep/brp/dws/.

Glossary

Zone I: The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

IWPA: A 400-foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone II. To determine IWPA radius, refer to the attached map.

Zone II: The primary recharge area defined by a hydrogeologic study.

Aquifer: An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

Hydrogeologic Barrier: An underground layer of impermeable material that resists penetration by water.

Recharge Area: The surface area that contributes water to a well.

Key issues include:

1. Wildlife/Natural microbial activity

The spring is located in an aquifer with a high vulnerability to contamination due to the absence of a significant hydrogeologic barrier to prevent contaminant migration. Springs are by their nature, considered to have a potential high vulnerability to contamination from activities on the land surface. However, there are no identified land use threats in the Zone I or Zone II of the sources and the initial MPA testing reported a low risk of surface water influence. Therefore, the overall ranking of susceptibility to contamination for the spring is low, based on the presence of one low ranked threatening land use or activity in the IWPA, as seen in Table 2.

1. Wildlife/Natural microbial activity – The springs are in relatively remote areas and the first round of microscopic particulate analysis indicates that the spring source is not under the influence of surface water. However, the sources must be protected and maintained to prevent deterioration of the infrastructure by controlling erosion and surface runoff around the springs. Wild animals, farm animals and domestic pets can be carriers of waterborne diseases such as *Giardia*, *Cryptosporidium*, *Salmonella*, etc. Microorganisms are microscopic creatures such as bacteria, viruses, and protozoa. Because some microorganisms are known pathogens, or disease causing agents, microbial contamination of public drinking water supplies poses a serious threat to human health.

Some known contaminants of concern in drinking water include: Bacteria, Escherichia coli (E.coli), Viruses, and Protozoa. Bacteria, viruses, and protozoa when ingested in drinking water can cause a number of infectious waterborne diseases such as cholera, typhoid, hepatitis, and infectious gastrointestinal diseases like cryptosporidiosis and giardiasis. Symptoms of waterborne disease may include fever, fatigue and weight loss (common in viral cases), vomiting, abdominal cramping, diarrhea, and stomachaches. In the most severe cases waterborne diseases can prove lethal.

Recommendations:

- ✓ Continue to maintain the infrastructure and control surface runoff.
- ✓ Monitor activities in the Zone I and Zone II. At other facilities, it has recently been confirmed that activities such as logging within the Zone I and II of the springs can have a detrimental impact on water quality due to the disturbance of thin overburden materials.

- ✓ Review ownership and control of lands within the Zone II and consider options for protecting that land.

2. Protection Recommendations

Implementing protection measures and best management practices (BMPs) will reduce the source's susceptibility to contamination. The association is commended for current and past protection measures including upgrading the infrastructure and ownership of land around the sources. With the delineation of the Zone II contribution areas for the springs, the district should review existing protection strategies, review land ownership in the Zone II and evaluate the potential for future protection of that area. If appropriate, work with the community in development of additional protection strategies.

Please review and adopt the key recommendations listed above as is feasible.

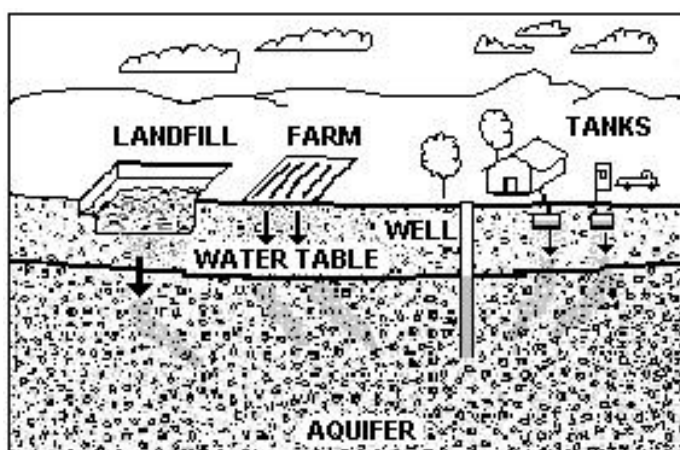


Figure 1: Example of how a well could become contaminated by different land uses and activities.

Additional Documents:

To help with source protection efforts, more information is available by request or online at www.state.ma.us/dep/brp/dws including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

For More Information:

Contact Catherine Skiba in DEP's Springfield Office at (413) 755-2119 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on the Drinking Water Program web site at:
www.state.ma.us/dep/brp/dws/

Zone I:

- ✓ Do not permit any non-water supply activities in Zone I.
- ✓ Continue regular inspections of the Zone I. Monitor for evidence of unauthorized access.
- ✓ Monitor activities and if there is evidence of increased activity or access, consider fencing and gating the immediate area around the springs.

Facilities Management:

- ✓ Control surface runoff around the springs to prevent infiltration and erosion.

Planning:

- ✓ Have a plan to address short-term water shortages and long-term water demands. Keep the phone number of a bottled water company readily available and continue assessment of future needs of the system.
- ✓ Consider reviewing land ownership in the Zone II and acquiring additional land. Monitor proposed activities in the recharge areas; the Department's recent experience with another public water supplier's spring system has shown that activities such as logging upgradient from spring sources may impact water quality.

Supplement the SWAP assessment with additional local information and incorporate it into water supply educational efforts. Use a potential contaminant threat inventory to assist in setting priorities, focusing inspections, and creating educational activities.

These recommendations are only part of your ongoing local drinking water source protection. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures.

Attachments

- ✓ Map of the Public Water Supply (PWS) Protection Area
- ✓ Recommended Source Protection Measures Fact Sheet